

IN THE UNITED STATES COURT OF APPEALS  
FOR THE DISTRICT OF COLUMBIA CIRCUIT

NOS. 20-1025 AND 20-1138

ENVIRONMENTAL HEALTH TRUST, CONSUMERS FOR SAFE  
CELL PHONES, ELIZABETH BARRIS, AND THEODORA  
SCARATO,

PETITIONERS,

v.

FEDERAL COMMUNICATIONS COMMISSION  
AND UNITED STATES OF AMERICA,

RESPONDENTS.

CHILDREN'S HEALTH DEFENSE, MICHELE HERTZ, PETRA  
BROKKEN, DR. DAVID O. CARPENTER, DR. TORIL H.  
JELTER, DR. ANN LEE, VIRGINIA FARVER, JENNIFER  
BARAN, AND PAUL STANLEY, M.Ed.,

PETITIONERS,

v.

FEDERAL COMMUNICATIONS COMMISSION  
AND UNITED STATES OF AMERICA,

RESPONDENTS.

ON PETITIONS FOR REVIEW OF AN ORDER OF THE  
FEDERAL COMMUNICATIONS COMMISSION

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UNITED STATES  
DEPARTMENT OF JUSTICE

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FEDERAL COMMUNICATIONS COMMISSION  
WASHINGTON, D.C. 20554



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**5 U.S.C. § 706**  
**§ 706. Scope of review**

To the extent necessary to decision and when presented, the reviewing court shall decide all relevant questions of law, interpret constitutional and statutory provisions, and determine the meaning or applicability of the terms of an agency action. The reviewing court shall--

\* \* \*

(2) hold unlawful and set aside agency action, findings, and conclusions found to be--

(A) arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law;

**21 U.S.C. § 360ii**  
**§ 360ii. Program of control**

**(a) Establishment**

The Secretary shall establish and carry out an electronic product radiation control program designed to protect the public health and safety from electronic product radiation. As a part of such program, he shall—

- (1) pursuant to section 360kk of this title, develop and administer performance standards for electronic products;
- (2) plan, conduct, coordinate, and support research, development, training, and operational activities to minimize the emissions of and the exposure of people to, unnecessary electronic product radiation;
- (3) maintain liaison with and receive information from other Federal and State departments and agencies with related interests, professional organizations, industry, industry and labor associations, and other organizations on present and future potential electronic product radiation;
- (4) study and evaluate emissions of, and conditions of exposure to, electronic product radiation and intense magnetic fields;
- (5) develop, test, and evaluate the effectiveness of procedures and techniques for minimizing exposure to electronic product radiation; and

(6) consult and maintain liaison with the Secretary of Commerce, the Secretary of Defense, the Secretary of Labor, the Atomic Energy Commission, and other appropriate Federal departments and agencies on (A) techniques, equipment, and programs for testing and evaluating electronic product radiation, and (B) the development of performance standards pursuant to section 360kk of this title to control such radiation emissions.

(b) Powers of Secretary

In carrying out the purposes of subsection (a), the Secretary is authorized to--

- (1) (A) collect and make available, through publications and other appropriate means, the results of, and other information concerning, research and studies relating to the nature and extent of the hazards and control of electronic product radiation; and (B) make such recommendations relating to such hazards and control as he considers appropriate;
  - (2) make grants to public and private agencies, organizations, and institutions, and to individuals for the purposes stated in paragraphs (2), (4), and (5) of subsection (a) of this section;
  - (3) contract with public or private agencies, institutions, and organizations, and with individuals, without regard to section 3324 of Title 31 and section 6101 of Title 41; and
  - (4) procure (by negotiation or otherwise) electronic products for research and testing purposes, and sell or otherwise dispose of such products.
- \* \* \*

**28 U.S.C.A. § 2342**  
**§ 2342. Jurisdiction of court of appeals**

The court of appeals (other than the United States Court of Appeals for the Federal Circuit) has exclusive jurisdiction to enjoin, set aside, suspend (in whole or in part), or to determine the validity of--

- (1) all final orders of the Federal Communications Commission made reviewable by section 402(a) of title 47;

\* \* \*

**47 U.S.C. § 151****§ 151. Purposes of chapter; Federal Communications Commission created**

For the purpose of regulating interstate and foreign commerce in communication by wire and radio so as to make available, so far as possible, to all the people of the United States, without discrimination on the basis of race, color, religion, national origin, or sex, a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges, for the purpose of the national defense, for the purpose of promoting safety of life and property through the use of wire and radio communications, and for the purpose of securing a more effective execution of this policy by centralizing authority heretofore granted by law to several agencies and by granting additional authority with respect to interstate and foreign commerce in wire and radio communication, there is created a commission to be known as the "Federal Communications Commission", which shall be constituted as hereinafter provided, and which shall execute and enforce the provisions of this chapter.

**47 U.S.C. § 157(a)****§ 157. New technologies and services**

(a) It shall be the policy of the United States to encourage the provision of new technologies and services to the public. Any person or party (other than the Commission) who opposes a new technology or service proposed to be permitted under this chapter shall have the burden to demonstrate that such proposal is inconsistent with the public interest.

**47 U.S.C. § 301****§ 301. License for radio communication or transmission of energy**

It is the purpose of this chapter, among other things, to maintain the control of the United States over all the channels of radio transmission; and to provide for the use of such channels, but not the ownership thereof, by persons for limited periods of time, under licenses granted by Federal authority, and no such license shall be construed to create any right, beyond the terms, conditions, and periods of the license. No person shall use or operate any apparatus for the transmission of energy or communications or signals by radio (a) from one place in any State, Territory, or possession of the United States or in the District of Columbia to another place in the same State, Territory, possession, or District; or (b) from any State, Territory, or possession of the United States, or from the District of Columbia to any other State, Territory, or possession of the United States; or (c)

from any place in any State, Territory, or possession of the United States, or in the District of Columbia, to any place in any foreign country or to any vessel; or (d) within any State when the effects of such use extend beyond the borders of said State, or when interference is caused by such use or operation with the transmission of such energy, communications, or signals from within said State to any place beyond its borders, or from any place beyond its borders to any place within said State, or with the transmission or reception of such energy, communications, or signals from and/or to places beyond the borders of said State; or (e) upon any vessel or aircraft of the United States (except as provided in section 303(t) of this title); or (f) upon any other mobile stations within the jurisdiction of the United States, except under and in accordance with this chapter and with a license in that behalf granted under the provisions of this chapter.

**47 U.S.C. § 302a**  
**§ 302a. Devices which interfere with radio reception**

**(a) Regulations**

The Commission may, consistent with the public interest, convenience, and necessity, make reasonable regulations (1) governing the interference potential of devices which in their operation are capable of emitting radio frequency energy by radiation, conduction, or other means in sufficient degree to cause harmful interference to radio communications; and (2) establishing minimum performance standards for home electronic equipment and systems to reduce their susceptibility to interference from radio frequency energy. Such regulations shall be applicable to the manufacture, import, sale, offer for sale, or shipment of such devices and home electronic equipment and systems, and to the use of such devices.

\* \* \*

**47 U.S.C. § 303**  
**§ 303. Powers and duties of Commission**

Except as otherwise provided in this chapter, the Commission from time to time, as public convenience, interest, or necessity requires, shall--

**(a) Classify radio stations;**

**(b) Prescribe the nature of the service to be rendered by each class of licensed stations and each station within any class;**

- (c) Assign bands of frequencies to the various classes of stations, and assign frequencies for each individual station and determine the power which each station shall use and the time during which it may operate;
- (d) Determine the location of classes of stations or individual stations;
- (e) Regulate the kind of apparatus to be used with respect to its external effects and the purity and sharpness of the emissions from each station and from the apparatus therein;
- (f) Make such regulations not inconsistent with law as it may deem necessary to prevent interference between stations and to carry out the provisions of this chapter: *Provided, however,* That changes in the frequencies, authorized power, or in the times of operation of any station, shall not be made without the consent of the station licensee unless the Commission shall determine that such changes will promote public convenience or interest or will serve public necessity, or the provisions of this chapter will be more fully complied with;

**47 U.S.C. § 308**  
**§ 308. Requirements for license**

**(a) Writing; exceptions**

The Commission may grant construction permits and station licenses, or modifications or renewals thereof, only upon written application therefor received by it: *Provided,* That (1) in cases of emergency found by the Commission involving danger to life or property or due to damage to equipment, or (2) during a national emergency proclaimed by the President or declared by the Congress and during the continuance of any war in which the United States is engaged and when such action is necessary for the national defense or security or otherwise in furtherance of the war effort, or (3) in cases of emergency where the Commission finds, in the nonbroadcast services, that it would not be feasible to secure renewal applications from existing licensees or otherwise to follow normal licensing procedure, the Commission may grant construction permits and station licenses, or modifications or renewals thereof, during the emergency so found by the Commission or during the continuance of any such national emergency or war, in such manner and upon such terms and conditions as the Commission shall by regulation prescribe, and without the filing of a formal application, but no authorization so granted shall continue in effect beyond the period of the emergency or war requiring it: *Provided further,* That the Commission may issue by cable, telegraph, or radio a permit for the operation of a station on a vessel of

the United States at sea, effective in lieu of a license until said vessel shall return to a port of the continental United States.

\* \* \*

**47 U.S.C. § 309**  
**§ 309. Application for license**

\* \* \*

(j) Use of competitive bidding

\* \* \*

(3) Design of systems of competitive bidding

For each class of licenses or permits that the Commission grants through the use of a competitive bidding system, the Commission shall, by regulation, establish a competitive bidding methodology. The Commission shall seek to design and test multiple alternative methodologies under appropriate circumstances. The Commission shall, directly or by contract, provide for the design and conduct (for purposes of testing) of competitive bidding using a contingent combinatorial bidding system that permits prospective bidders to bid on combinations or groups of licenses in a single bid and to enter multiple alternative bids within a single bidding round. In identifying classes of licenses and permits to be issued by competitive bidding, in specifying eligibility and other characteristics of such licenses and permits, and in designing the methodologies for use under this subsection, the Commission shall include safeguards to protect the public interest in the use of the spectrum and shall seek to promote the purposes specified in section 151 of this title and the following objectives:

\* \* \*

(D) efficient and intensive use of the electromagnetic spectrum;

**47 U.S.C. § 402**  
**§ 402. Judicial review of Commission's orders and decisions**

(a) Procedure

Any proceeding to enjoin, set aside, annul, or suspend any order of the Commission under this chapter (except those appealable under subsection (b) of this section) shall be brought as provided by and in the manner prescribed in chapter 158 of Title 28.

**47 U.S.C. § 405****§ 405. Petition for reconsideration; procedure; disposition; time of filing; additional evidence; time for disposition of petition for reconsideration of order concluding hearing or investigation; appeal of order**

(a) After an order, decision, report, or action has been made or taken in any proceeding by the Commission, or by any designated authority within the Commission pursuant to a delegation under section 155(c)(1) of this title, any party thereto, or any other person aggrieved or whose interests are adversely affected thereby, may petition for reconsideration only to the authority making or taking the order, decision, report, or action; and it shall be lawful for such authority, whether it be the Commission or other authority designated under section 155(c)(1) of this title, in its discretion, to grant such a reconsideration if sufficient reason therefor be made to appear. A petition for reconsideration must be filed within thirty days from the date upon which public notice is given of the order, decision, report, or action complained of. No such application shall excuse any person from complying with or obeying any order, decision, report, or action of the Commission, or operate in any manner to stay or postpone the enforcement thereof, without the special order of the Commission. The filing of a petition for reconsideration shall not be a condition precedent to judicial review of any such order, decision, report, or action, except where the party seeking such review (1) was not a party to the proceedings resulting in such order, decision, report, or action, or (2) relies on questions of fact or law upon which the Commission, or designated authority within the Commission, has been afforded no opportunity to pass. The Commission, or designated authority within the Commission, shall enter an order, with a concise statement of the reasons therefor, denying a petition for reconsideration or granting such petition, in whole or in part, and ordering such further proceedings as may be appropriate: *Provided*, That in any case where such petition relates to an instrument of authorization granted without a hearing, the Commission, or designated authority within the Commission, shall take such action within ninety days of the filing of such petition. Reconsiderations shall be governed by such general rules as the Commission may establish, except that no evidence other than newly discovered evidence, evidence which has become available only since the original taking of evidence, or evidence which the Commission or designated authority within the Commission believes should have been taken in the original proceeding shall be taken on any reconsideration. The time within which a petition for review must be filed in a proceeding to which section 402(a) of this title applies, or within which an appeal must be taken under section 402(b) of this title in any case, shall be computed from the date upon

which the Commission gives public notice of the order, decision, report, or action complained of.

(b)(1) Within 90 days after receiving a petition for reconsideration of an order concluding a hearing under section 204(a) of this title or concluding an investigation under section 208(b) of this title, the Commission shall issue an order granting or denying such petition.

(2) Any order issued under paragraph (1) shall be a final order and may be appealed under section 402(a) of this title.

**40 C.F.R. § 1502.9 (2017)**  
**§ 1502.9 Draft, final, and supplemental statements.**

Except for proposals for legislation as provided in § 1506.8 environmental impact statements shall be prepared in two stages and may be supplemented.

\* \* \*

(c) Agencies:

(1) Shall prepare supplements to either draft or final environmental impact statements if:

- (i) The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or
- (ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

**47 C.F.R. § 1.1306**  
**§ 1.1306 Actions which are categorically excluded from environmental processing.**

(a) Except as provided in § 1.1307 (c) and (d), Commission actions not covered by § 1.1307 (a) and (b) are deemed individually and cumulatively to have no significant effect on the quality of the human environment and are categorically excluded from environmental processing.

(b) Specifically, any Commission action with respect to any new application, or minor or major modifications of existing or authorized facilities or equipment, will be categorically excluded, provided such proposals do not:

- (1) Involve a site location specified under § 1.1307(a) (1)–(7), or
- (2) Involve high intensity lighting under § 1.1307(a)(8).
- (3) Result in human exposure to radiofrequency radiation in excess of the applicable safety standards specified in § 1.1307(b).

(c)(1) Unless § 1.1307(a)(4) is applicable, the provisions of § 1.1307(a) requiring the preparation of EAs do not encompass the construction of wireless facilities, including deployments on new or replacement poles, if:

- (i) The facilities will be located in a right-of-way that is designated by a Federal, State, local, or Tribal government for communications towers, above-ground utility transmission or distribution lines, or any associated structures and equipment;
- (ii) The right-of-way is in active use for such designated purposes; and
- (iii) The facilities would not
  - (A) Increase the height of the tower or non-tower structure by more than 10% or twenty feet, whichever is greater, over existing support structures that are located in the right-of-way within the vicinity of the proposed construction;
  - (B) Involve the installation of more than four new equipment cabinets or more than one new equipment shelter;
  - (C) Add an appurtenance to the body of the structure that would protrude from the edge of the structure more than twenty feet, or more than the width of the structure at the level of the appurtenance, whichever is greater (except that the deployment may exceed this size limit if necessary to shelter the antenna from inclement weather or to connect the antenna to the tower via cable); or

(D) Involve excavation outside the current site, defined as the area that is within the boundaries of the leased or owned property surrounding the deployment or that is in proximity to the structure and within the boundaries of the utility easement on which the facility is to be deployed, whichever is more restrictive.

(2) Such wireless facilities are subject to § 1.1307(b) and require EAs if their construction would result in human exposure to radiofrequency radiation in excess of the applicable health and safety guidelines cited in § 1.1307(b).

Note 1: The provisions of § 1.1307(a) requiring the preparation of EAs do not encompass the mounting of antenna(s) and associated equipment (such as wiring, cabling, cabinets, or backup-power), on or in an existing building, or on an antenna tower or other man-made structure, unless § 1.1307(a)(4) is applicable. Such antennas are subject to § 1.1307(b) of this part and require EAs if their construction would result in human exposure to radiofrequency radiation in excess of the applicable health and safety guidelines cited in § 1.1307(b) of this part. The provisions of § 1.1307 (a) and (b) of this part do not encompass the installation of aerial wire or cable over existing aerial corridors of prior or permitted use or the underground installation of wire or cable along existing underground corridors of prior or permitted use, established by the applicant or others. The use of existing buildings, towers or corridors is an environmentally desirable alternative to the construction of new facilities and is encouraged. The provisions of § 1.1307(a) and (b) of this part do not encompass the construction of new submarine cable systems.

Note 2: The specific height of an antenna tower or supporting structure, as well as the specific diameter of a satellite earth station, in and of itself, will not be deemed sufficient to warrant environmental processing, see § 1.1307 and § 1.1308, except as required by the Bureau pursuant to the Note to § 1.1307(d).

Note 3: The construction of an antenna tower or supporting structure in an established “antenna farm”: (i.e., an area in which similar antenna towers are clustered, whether or not such area has been officially designated as an antenna farm), will be categorically excluded unless one or more of the antennas to be mounted on the tower or structure are subject to the provisions of § 1.1307(b) and the additional radiofrequency radiation from the antenna(s) on the new tower or structure would cause human exposure in excess of the applicable health and safety guidelines cited in § 1.1307(b).

**47 C.F.R. § 1.1307****§ 1.1307 Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared.**

(a) Commission actions with respect to the following types of facilities may significantly affect the environment and thus require the preparation of EAs by the applicant (see §§ 1.1308 and 1.1311) and may require further Commission environmental processing (see §§ 1.1314, 1.1315 and 1.1317):

(1) Facilities that are to be located in an officially designated wilderness area.

(2) Facilities that are to be located in an officially designated wildlife preserve.

(3) Facilities that:

(i) May affect listed threatened or endangered species or designated critical habitats; or

(ii) are likely to jeopardize the continued existence of any proposed endangered or threatened species or likely to result in the destruction or adverse modification of proposed critical habitats, as determined by the Secretary of the Interior pursuant to the Endangered Species Act of 1973.

Note: The list of endangered and threatened species is contained in 50 CFR 17.11, 17.22, 222.23(a) and 227.4. The list of designated critical habitats is contained in 50 CFR 17.95, 17.96 and part 226. To ascertain the status of proposed species and habitats, inquiries may be directed to the Regional Director of the Fish and Wildlife Service, Department of the Interior.

(4) Facilities that may affect districts, sites, buildings, structures or objects, significant in American history, architecture, archeology, engineering or culture, that are listed, or are eligible for listing, in the National Register of Historic Places (see 54 U.S.C. 300308; 36 CFR parts 60 and 800), and that are subject to review pursuant to section 1.1320 and have been determined through that review process to have adverse effects on identified historic properties.

(5) Facilities that may affect Indian religious sites.

(6) Facilities to be located in floodplains, if the facilities will not be placed at least one foot above the base flood elevation of the floodplain.

(7) Facilities whose construction will involve significant change in surface features (e.g., wetland fill, deforestation or water diversion). (In the case of wetlands on Federal property, see Executive Order 11990.)

(8) Antenna towers and/or supporting structures that are to be equipped with high intensity white lights which are to be located in residential neighborhoods, as defined by the applicable zoning law.

<Text of subsection (b) in effect until OMB approval given for amendment by 85 FR 18142, as delayed as 85 FR 33578.>

(b) In addition to the actions listed in paragraph (a) of this section, Commission actions granting construction permits, licenses to transmit or renewals thereof, equipment authorizations or modifications in existing facilities, require the preparation of an Environmental Assessment (EA) if the particular facility, operation or transmitter would cause human exposure to levels of radiofrequency radiation in excess of the limits in §§ 1.1310 and 2.1093 of this chapter.

Applications to the Commission for construction permits, licenses to transmit or renewals thereof, equipment authorizations or modifications in existing facilities must contain a statement confirming compliance with the limits unless the facility, operation, or transmitter is categorically excluded, as discussed below. Technical information showing the basis for this statement must be submitted to the Commission upon request. Such compliance statements may be omitted from license applications for transceivers subject to the certification requirement in § 25.129 of this chapter.

(1) The appropriate exposure limits in §§ 1.1310 and 2.1093 of this chapter are generally applicable to all facilities, operations and transmitters regulated by the Commission. However, a determination of compliance with the exposure limits in § 1.1310 or § 2.1093 of this chapter (routine environmental evaluation), and preparation of an EA if the limits are exceeded, is necessary only for facilities, operations and transmitters that fall into the categories listed in table 1, or those specified in paragraph (b)(2) of this section. All other facilities, operations and transmitters are categorically excluded from making such studies or preparing an EA, except as indicated in paragraphs (c) and (d) of this section. For purposes of table 1, building-

mounted antennas means antennas mounted in or on a building structure that is occupied as a workplace or residence. The term power in column 2 of table 1 refers to total operating power of the transmitting operation in question in terms of effective radiated power (ERP), equivalent isotropically radiated power (EIRP), or peak envelope power (PEP), as defined in § 2.1 of this chapter. For the case of the Cellular Radiotelephone Service, subpart H of part 22 of this chapter; the Personal Communications Service, part 24 of this chapter and the Specialized Mobile Radio Service, part 90 of this chapter, the phrase total power of all channels in column 2 of table 1 means the sum of the ERP or EIRP of all co-located simultaneously operating transmitters owned and operated by a single licensee. When applying the criteria of table 1, radiation in all directions should be considered. For the case of transmitting facilities using sectorized transmitting antennas, applicants and licensees should apply the criteria to all transmitting channels in a given sector, noting that for a highly directional antenna there is relatively little contribution to ERP or EIRP summation for other directions.

Table 1—Transmitters, Facilities and Operations Subject to Routine Environmental Evaluation

Service (title 47 CFR rule part)	Evaluation required if:
Experimental Radio Services (part 5)	Power > 100 W ERP (164 W EIRP).
Commercial Mobile Radio Services (part 20)	Non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and power > 1000 W ERP (1640 W EIRP). Building-mounted antennas: power > 1000 W ERP (1640 W EIRP). Consumer Signal Booster equipment grantees under the Commercial Mobile Radio Services provisions in part 20 are required to attach a label to Fixed Consumer Booster antennas that: (1) Provides adequate notice regarding potential radiofrequency safety hazards, e.g., information regarding the safe minimum separation distance required between users and transmitting antennas; and (2) references the applicable FCC-adopted limits for radiofrequency exposure specified in § 1.1310.
Paging and Radiotelephone Service (subpart E of part 22)	Non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and power > 1000 W ERP (1640 W EIRP).
Cellular Radiotelephone Service (subpart H of part 22)	Building-mounted antennas: power > 1000 W ERP (1640 W EIRP). Non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and total power of all channels > 1000 W ERP (1640 W EIRP). Building-mounted antennas: total power of all channels > 1000 W ERP (1640 W EIRP).
Personal Communications Services (part 24)	(1) Narrowband PCS (subpart D):  Non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and total power of all channels > 1000 W ERP (1640 W EIRP). Building-mounted antennas: total power of all channels > 1000 W ERP (1640 W EIRP).

	(2) Broadband PCS (subpart E): Non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and total power of all channels > 2000 W ERP (3280 W EIRP). Building-mounted antennas: total power of all channels > 2000 W ERP (3280 W EIRP).
Satellite Communications Services (part 25)	All included.
	In addition, for NGSO subscriber equipment, licensees are required to attach a label to subscriber transceiver antennas that: (1) provides adequate notice regarding potential radiofrequency safety hazards, e.g., information regarding the safe minimum separation distance required between users and transceiver antennas; and (2) references the applicable FCC-adopted limits for radiofrequency exposure specified in § 1.1310 of this chapter.
Miscellaneous Wireless Communications Services (part 27 except subpart M)	(1) For the 1390-1392 MHz, 1392-1395 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz bands:  Non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and total power of all channels > 2000 W ERP (3280 W EIRP). Building-mounted antennas: total power of all channels > 2000 W ERP (3280 W EIRP). (2) For the 698-746 MHz, 746-764 MHz, 776-794 MHz, 2305-2320 MHz, and 2345-2360 MHz bands: Total power of all channels > 1000 W ERP (1640 W EIRP). Non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and power > 1640 W EIRP.
Broadband Radio Service and Educational Broadband Service (subpart M of part 27)	Building-mounted antennas: power > 1640 W EIRP. BRS and EBS licensees are required to attach a label to subscriber transceiver or transverter antennas that: (1) provides adequate notice regarding potential radiofrequency safety hazards, e.g., information regarding the safe minimum separation distance required between users and transceiver antennas; and (2) references the applicable FCC-adopted limits for radiofrequency exposure specified in § 1.1310.
Upper Microwave Flexible Use Service (part 30)	Non-building-mounted antennas: Height above ground level to lowest point of antenna <10 m and power >1640 W EIRP.
Radio Broadcast Services (part 73)	All included.
Auxiliary and Special Broadcast and Other Program Distributional Services (part 74)	Subparts G and L: Power > 100 W ERP.
Stations in the Maritime Services (part 80)	Ship earth stations only.
Private Land Mobile Radio Services Paging Operations (subpart P of part 90)	Non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and power > 1000 W ERP (1640 W EIRP).  Building-mounted antennas: power > 1000 W ERP (1640 W EIRP).

Private Land Mobile Radio Services Specialized Mobile Radio (subpart S of part 90)	Non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and total power of all channels > 1000 W ERP (1640 W EIRP).
76-81 GHz Radar Service (part 95)	Building-mounted antennas: Total power of all channels > 1000 W ERP (1640 W EIRP). All included.
Amateur Radio Service (part 97)	Transmitter output power > levels specified in § 97.13(c)(1) of this chapter.
Local Multipoint Distribution Service (subpart L of part 101) and 24 GHz (subpart G of part 101)	Non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and power > 1640 W EIRP.
70/80/90 GHz Bands (subpart Q of part 101)	<p>Building-mounted antennas: power &gt; 1640 W EIRP. LMDS and 24 GHz Service licensees are required to attach a label to subscriber transceiver antennas that:</p> <p>(1) provides adequate notice regarding potential radiofrequency safety hazards, e.g., information regarding the safe minimum separation distance required between users and transceiver antennas; and</p> <p>(2) references the applicable FCC-adopted limits for radiofrequency exposure specified in § 1.1310.</p> <p>Non-building-mounted antennas: height above ground level to lowest point of antenna &lt; 10 m and power &gt; 1640 W EIRP.</p> <p>Building-mounted antennas: power &gt; 1640 W EIRP. Licensees are required to attach a label to transceiver antennas that:</p> <p>(1) provides adequate notice regarding potential radiofrequency safety hazards, e.g., information regarding the safe minimum separation distance required between users and transceiver antennas; and</p> <p>(2) references the applicable FCC-adopted limits for radiofrequency exposure specified in § 1.1310.</p>

(2)(i) Mobile and portable transmitting devices that operate in the Commercial Mobile Radio Services pursuant to part 20 of this chapter; the Cellular Radiotelephone Service pursuant to part 22 of this chapter; the Personal Communications Services (PCS) pursuant to part 24 of this chapter; the Satellite Communications Services pursuant to part 25 of this chapter; the Miscellaneous Wireless Communications Services pursuant to part 27 of this chapter; the Upper Microwave Flexible User Service pursuant to part 30 of this chapter; the Maritime Services (ship earth stations only) pursuant to part 80 of this chapter; the Specialized Mobile Radio Service, the 4.9 GHz Band Service, and the 3650 MHz Wireless Broadband Service pursuant to part 90 of this chapter; the Wireless Medical Telemetry Service (WMTS), the Medical Device Radiocommunication Service (MedRadio), and the 76–81 GHz Band Radar Service pursuant to part 95 of this chapter; and the Citizens Broadband Radio Service pursuant to part 96 of this chapter are subject to routine environmental evaluation for RF exposure prior to

equipment authorization or use, as specified in §§ 2.1091 and 2.1093 of this chapter.

(ii) Unlicensed PCS, unlicensed NII, and millimeter-wave devices are also subject to routine environmental evaluation for RF exposure prior to equipment authorization or use, as specified in §§ 15.255(f), 15.257(g), 15.319(i), and 15.407(f) of this chapter.

(iii) Portable transmitting equipment for use in the Wireless Medical Telemetry Service (WMTS) is subject to routine environmental evaluation as specified in §§ 2.1093 and 95.2385 of this chapter.

(iv) Equipment authorized for use in the Medical Device Radiocommunication Service (MedRadio) as a medical implant device or body-worn transmitter (as defined in subpart I of part 95 of this chapter) is subject to routine environmental evaluation for RF exposure prior to equipment authorization, as specified in §§ 2.1093 and 95.2585 of this chapter by finite difference time domain (FDTD) computational modeling or laboratory measurement techniques. Where a showing is based on computational modeling, the Commission retains the discretion to request that supporting documentation and/or specific absorption rate (SAR) measurement data be submitted.

(v) All other mobile, portable, and unlicensed transmitting devices are categorically excluded from routine environmental evaluation for RF exposure under §§ 2.1091, 2.1093 of this chapter except as specified in paragraphs (c) and (d) of this section.

(3) In general, when the guidelines specified in § 1.1310 are exceeded in an accessible area due to the emissions from multiple fixed transmitters, actions necessary to bring the area into compliance are the shared responsibility of all licensees whose transmitters produce, at the area in question, power density levels that exceed 5% of the power density exposure limit applicable to their particular transmitter or field strength levels that, when squared, exceed 5% of the square of the electric or magnetic field strength limit applicable to their particular transmitter. Owners of transmitter sites are expected to allow applicants and licensees to take reasonable steps to comply with the requirements contained in § 1.1307(b) and, where feasible, should encourage co-location of transmitters and common solutions for

controlling access to areas where the RF exposure limits contained in § 1.1310 might be exceeded.

- (i) Applicants for proposed (not otherwise excluded) transmitters, facilities or modifications that would cause non-compliance with the limits specified in § 1.1310 at an accessible area previously in compliance must submit an EA if emissions from the applicant's transmitter or facility would result, at the area in question, in a power density that exceeds 5% of the power density exposure limit applicable to that transmitter or facility or in a field strength that, when squared, exceeds 5% of the square of the electric or magnetic field strength limit applicable to that transmitter or facility.
- (ii) Renewal applicants whose (not otherwise excluded) transmitters or facilities contribute to the field strength or power density at an accessible area not in compliance with the limits specified in § 1.1310 must submit an EA if emissions from the applicant's transmitter or facility results, at the area in question, in a power density that exceeds 5% of the power density exposure limit applicable to that transmitter or facility or in a field strength that, when squared, exceeds 5% of the square of the electric or magnetic field strength limit applicable to that transmitter or facility.

<Text of subsection (b) revised by 85 FR 18146, not effective until OMB approval given, as corrected by 85 FR 33578.>

(b)(1) Requirements.

- (i) With respect to the limits on human exposure to RF provided in § 1.1310 of this chapter, applicants to the Commission for the grant or modification of construction permits, licenses or renewals thereof, temporary authorities, equipment authorizations, or any other authorizations for radiofrequency sources must either:
  - (A) Determine that they qualify for an exemption pursuant to § 1.1307(b)(3);
  - (B) Prepare an evaluation of the human exposure to RF radiation pursuant to § 1.1310 and include in the application a statement confirming compliance with the limits in § 1.1310; or

(C) Prepare an Environmental Assessment if those RF sources would cause human exposure to levels of RF radiation in excess of the limits in § 1.1310.

(ii) Compliance with these limits for fixed RF source(s) may be accomplished by use of mitigation actions, as provided in § 1.1307(b)(4). Upon request by the Commission, the party seeking or holding such authorization must submit technical information showing the basis for such compliance, either by exemption or evaluation. Notwithstanding the preceding requirements, in the event that RF sources cause human exposure to levels of RF radiation in excess of the limits in § 1.1310 of this chapter, such RF exposure exemptions and evaluations are not deemed sufficient to show that there is no significant effect on the quality of the human environment or that the RF sources are categorically excluded from environmental processing.

(2) Definitions. For the purposes of this section, the following definitions shall apply.

Available maximum time-averaged power for an RF source is the maximum available RF power (into a matched load) as averaged over a time-averaging period;

Category One is any spatial region that is compliant with the general population exposure limit with continuous exposure or source-based time-averaged exposure;

Category Two is any spatial region where the general population exposure limit is exceeded but that is compliant with the occupational exposure limit with continuous exposure;

Category Three is any spatial region where the occupational exposure limit is exceeded but by no more than ten times the limit;

Category Four is any spatial region where the exposure is more than ten times the occupational exposure limit or where there is a possibility for serious injury on contact.

Continuous exposure refers to the maximum time-averaged exposure at a given location for an RF source and assumes that exposure may take place indefinitely. The exposure limits in § 1.1310 of this chapter are used to establish the spatial regions where mitigation measures are necessary assuming continuous exposure as prescribed in § 1.1307(b)(4) of this chapter.

Effective Radiated Power (ERP) is the product of the maximum antenna gain which is the largest far-field power gain relative to a dipole in any direction for each transverse polarization component, and the maximum delivered time-averaged power which is the largest net power delivered or supplied to an antenna as averaged over a time-averaging period; ERP is summed over two polarizations when present;

Exemption for (an) RF source(s) is solely from the obligation to perform a routine environmental evaluation to demonstrate compliance with the RF exposure limits in § 1.1310 of this chapter; it is not exemption from the equipment authorization procedures described in part 2 of this chapter, not exemption from general obligations of compliance with the RF exposure limits in § 1.1310 of this chapter, and not exemption from determination of whether there is no significant effect on the quality of the human environment under § 1.1306 of this chapter.

Fixed RF source is one that is physically secured at one location, even temporarily, and is not able to be easily moved to another location while radiating;

Mobile device is as defined in § 2.1091(b) of this chapter;

Plane-wave equivalent power density is the square of the root-mean-square (rms) electric field strength divided by the impedance of free space (377 ohms).

Portable device is as defined in § 2.1093(b) of this chapter;

Positive access control is mitigation by proactive preclusion of unauthorized access to the region surrounding an RF source where the continuous exposure limit for the general population is exceeded. Examples of such controls include locked doors, ladder cages, or effective fences, as well as enforced prohibition of public access to external surfaces of buildings.

However, it does not include natural barriers or other access restrictions that did not require any action on the part of the licensee or property management.

Radiating structure is an unshielded RF current-carrying conductor that generates an RF reactive near electric or magnetic field and/or radiates an RF electromagnetic wave. It is the component of an RF source that transmits, generates, or reradiates an RF fields, such as an antenna, aperture, coil, or plate.

RF source is Commission-regulated equipment that transmits or generates RF fields or waves, whether intentionally or unintentionally, via one or more radiating structure(s). Multiple RF sources may exist in a single device.

Separation distance (variable R in Table 1) is the minimum distance in any direction from any part of a radiating structure and any part of the body of a nearby person;

Source-based time averaging is an average of instantaneous exposure over a time-averaging period that is based on an inherent property or duty-cycle of a device to ensure compliance with the continuous exposure limits;

Time-averaging period is a time period not to exceed 30 minutes for fixed RF sources or a time period inherent from device transmission characteristics not to exceed 30 minutes for mobile and portable RF sources;

Transient individual is an untrained person in a location where occupational/controlled limits apply, and he or she must be made aware of the potential for exposure and be supervised by trained personnel pursuant to § 1.1307(b)(4) of this chapter where use of time averaging is required to ensure compliance with the general population exposure limits in § 1.1310 of this chapter.

(3) Determination of exemption.

- (i) For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);

(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold  $P_{th}$  (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive).  $P_{th}$  is given by:

(C) Or using Table 1 and the minimum separation distance ( $R$  in meters) from the body of a nearby person for the frequency ( $f$  in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply,  $R$  must be at least  $\lambda/2\pi$ , where  $\lambda$  is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of  $\lambda/4$  or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to § 1.1307(b)(3)(i)(C)—Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2$ .
1.34-30	$3,450 R^2/f^2$ .
30-300	$3.83 R^2$ .
300-1,500	$0.0128 R^2 f$ .
1,500-100,000	$19.2R^2$ .

(ii) For multiple RF sources: Multiple RF sources are exempt if:

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance

of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).

(B) in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for  $P_{th}$ , including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

$P_i$  = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

$P_{th,i}$  = the exemption threshold power ( $P_{th}$ ) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source i.

$ERP_j$  = the ERP of fixed, mobile, or portable RF source j.

$ERP_{th,j}$  = exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least  $\lambda/2\pi$  according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

$Evaluated_k$  = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.

Exposure Limit<sub>k</sub> = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k, as applicable from § 1.1310 of this chapter.

(4) Mitigation.

- (i) As provided in paragraphs (b)(4)(ii) through (vi) of this section, specific mitigation actions are required for fixed RF sources to the extent necessary to ensure compliance with our exposure limits, including the implementation of an RF safety plan, restriction of access to those RF sources, and disclosure of spatial regions where exposure limits are exceeded.
- (ii) Category One—INFORMATION: No mitigation actions are required when the RF source does not cause continuous or source-based time-averaged exposure in excess of the general population limit in s§ 1.1310 of this part. Optionally a green “INFORMATION” sign may offer information to those persons who might be approaching RF sources. This optional sign, when used, must include at least the following information: Appropriate signal word “INFORMATION” and associated color (green), an explanation of the safety precautions to be observed when closer to the antenna than the information sign, a reminder to obey all postings and boundaries (if higher categories are nearby), up-to-date licensee (or operator) contact information (if higher categories are nearby), and a place to get additional information (such as a website, if no higher categories are nearby).
- (iii) Category Two—NOTICE: Mitigation actions are required in the form of signs and positive access control surrounding the boundary where the continuous exposure limit is exceeded for the general population, with the appropriate signal word “NOTICE” and associated color (blue) on the signs. Signs must contain the

components discussed in paragraph (b)(4)(vi) of this section. Under certain controlled conditions, such as on a rooftop with limited access, a sign attached directly to the surface of an antenna will be considered sufficient if the sign specifies a minimum approach distance and is readable at this separation distance and at locations required for compliance with the general population exposure limit in § 1.1310 of this part. Appropriate training is required for any occupational personnel with access to controlled areas within restrictive barriers where the general population exposure limit is exceeded, and transient individuals must be supervised by trained occupational personnel upon entering any of these areas. Use of time averaging is required for transient individuals to ensure compliance with the general population exposure limit.

(iv) Category Three—CAUTION: Signs (with the appropriate signal word “CAUTION” and associated color (yellow) on the signs), controls, or indicators (e.g., chains, railings, contrasting paint, diagrams) are required (in addition to the positive access control established for Category Two) surrounding the area in which the exposure limit for occupational personnel in a controlled environment is exceeded by no more than a factor of ten. Signs must contain the components discussed in paragraph (b)(4)(vi) of this section. If the boundaries between Category Two and Three are such that placement of both Category Two and Three signs would be in the same location, then the Category Two sign is optional. Under certain controlled conditions, such as on a rooftop with limited access, a sign may be attached directly to the surface of an antenna within a controlled environment if it specifies the minimum approach distance and is readable at this distance and at locations required for compliance with the occupational exposure limit in § 1.1310 of this part. If signs are not used at the occupational exposure limit boundary, controls or indicators (e.g., chains, railings, contrasting paint, diagrams, etc.) must designate the boundary where the occupational exposure limit is exceeded. Additionally, appropriate training is required for any occupational personnel with access to the controlled area where the general population exposure limit is exceeded, and transient individuals must be supervised by trained personnel upon entering any of these areas. Use of time averaging is required for transient individuals to ensure compliance with the general population exposure limit. Further mitigation by reducing exposure time in accord with

six-minute time averaging is required for occupational personnel in the area in which the occupational exposure limit is exceeded.

However, proper use of RF personal protective equipment may be considered sufficient in lieu of time averaging for occupational personnel in the areas in which the occupational exposure limit is exceeded. If such procedures or power reduction, and therefore Category reduction, are not feasible, then lockout/tagout procedures in 29 CFR 1910.147 must be followed.

(v) Category Four—WARNING/DANGER: Where the occupational limit could be exceeded by a factor of more than ten, “WARNING” signs with the associated color (orange), controls, or indicators (e.g., chains, railings, contrasting paint, diagrams) are required (in addition to the positive access control established for Category Two) surrounding the area in which the occupational exposure limit in a controlled environment is exceeded by more than a factor of ten Signs must contain the components discussed in paragraph (b)(4)(vi) of this section. “DANGER” signs with the associated color (red) are required where immediate and serious injury will occur on contact, in addition to positive access control, regardless of mitigation actions taken in Categories Two or Three. If the boundaries between Category Three and Four are such that placement of both Category Three and Four signs would be in the same location, then the Category Three sign is optional. No access is permitted without Category reduction. If power reduction, and therefore Category reduction, is not feasible, then lockout/tagout procedures in 29 CFR 1910.147 must be followed.

(vi) RF exposure advisory signs must be viewable and readable from the boundary where the applicable exposure limits are exceeded, pursuant to 29 CFR 1910.145, and include at least the following five components:

(A) Appropriate signal word, associated color {i.e., {DANGER” (red), “WARNING” (orange), “CAUTION,” (yellow) “NOTICE” (blue)};}

(B) RF energy advisory symbol;

(C) An explanation of the RF source;

(D) Behavior necessary to comply with the exposure limits; and

(E) Up-to-date contact information.

(5) Responsibility for compliance.

(i) In general, when the exposure limits specified in § 1.1310 of this part are exceeded in an accessible area due to the emissions from multiple fixed RF sources, actions necessary to bring the area into compliance or preparation of an Environmental Assessment (EA) as specified in § 1.1311 of this part are the shared responsibility of all licensees whose RF sources produce, at the area in question, levels that exceed 5% of the applicable exposure limit proportional to power. However, a licensee demonstrating that its facility was not the most recently modified or newly-constructed facility at the site establishes a rebuttable presumption that such licensee should not be liable in an enforcement proceeding relating to the period of non-compliance. Field strengths must be squared to be proportional to SAR or power density. Specifically, these compliance requirements apply if the square of the electric or magnetic field strength exposure level applicable to a particular RF source exceeds 5% of the square of the electric or magnetic field strength limit at the area in question where the levels due to multiple fixed RF sources exceed the exposure limit. Site owners and managers are expected to allow applicants and licensees to take reasonable steps to comply with the requirements contained in paragraph (b)(1) of this section and, where feasible, should encourage co-location of RF sources and common solutions for controlling access to areas where the RF exposure limits contained in § 1.1310 of this part might be exceeded. Applicants and licensees are required to share technical information necessary to ensure joint compliance with the exposure limits, including informing other licensees at a site in question of evaluations indicating possible non-compliance with the exposure limits.

(ii) Applicants for proposed RF sources that would cause non-compliance with the limits specified in § 1.1310 at an accessible area previously in compliance must submit an EA if emissions from the applicant's RF source would produce, at the area in question, levels that exceed 5% of the applicable exposure limit. Field strengths must be squared if necessary to be proportional to SAR or power density.

(iii) Renewal applicants whose RF sources would cause non-compliance with the limits specified in § 1.1310 at an accessible area previously in compliance must submit an EA if emissions from the applicant's RF source would produce, at the area in question, levels that exceed 5% of the applicable exposure limit. Field strengths must be squared if necessary to be proportional to SAR or power density.

(c) If an interested person alleges that a particular action, otherwise categorically excluded, will have a significant environmental effect, the person shall submit to the Bureau responsible for processing that action a written petition setting forth in detail the reasons justifying or circumstances necessitating environmental consideration in the decision-making process. (See § 1.1313). The Bureau shall review the petition and consider the environmental concerns that have been raised. If the Bureau determines that the action may have a significant environmental impact, the Bureau will require the applicant to prepare an EA (see §§ 1.1308 and 1.1311), which will serve as the basis for the determination to proceed with or terminate environmental processing.

(d) If the Bureau responsible for processing a particular action, otherwise categorically excluded, determines that the proposal may have a significant environmental impact, the Bureau, on its own motion, shall require the applicant to submit an EA. The Bureau will review and consider the EA as in paragraph (c) of this section.

Note to paragraph (d): Pending a final determination as to what, if any, permanent measures should be adopted specifically for the protection of migratory birds, the Bureau shall require an Environmental Assessment for an otherwise categorically excluded action involving a new or existing antenna structure, for which an antenna structure registration application (FCC Form 854) is required under part 17 of this chapter, if the proposed antenna structure will be over 450 feet in height above ground level (AGL) and involves either:

1. Construction of a new antenna structure;
2. Modification or replacement of an existing antenna structure involving a substantial increase in size as defined in paragraph I(C)(1)(3) of Appendix B to part 1 of this chapter; or
3. Addition of lighting or adoption of a less preferred lighting style as defined in § 17.4(c)(1)(iii) of this chapter. The Bureau shall consider whether to require an EA for other antenna structures subject to § 17.4(c) of this chapter in accordance with § 17.4(c)(8) of this chapter. An Environmental Assessment required pursuant to this note will be subject to the same procedures that apply to any Environmental

Assessment required for a proposed tower or modification of an existing tower for which an antenna structure registration application (FCC Form 854) is required, as set forth in § 17.4(c) of this chapter.

(e) No State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the regulations contained in this chapter concerning the environmental effects of such emissions. For purposes of this paragraph:

(1) The term personal wireless service means commercial mobile services, unlicensed wireless services, and common carrier wireless exchange access services;

(2) The term personal wireless service facilities means facilities for the provision of personal wireless services;

(3) The term unlicensed wireless services means the offering of telecommunications services using duly authorized devices which do not require individual licenses, but does not mean the provision of direct-to-home satellite services; and

(4) The term direct-to-home satellite services means the distribution or broadcasting of programming or services by satellite directly to the subscriber's premises without the use of ground receiving or distribution equipment, except at the subscriber's premises or in the uplink process to the satellite.

**47 C.F.R. § 1.1310**  
**§ 1.1310 Radiofrequency radiation exposure limits.**

(a) Specific absorption rate (SAR) shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in § 1.1307(b) of this part within the frequency range of 100 kHz to 6 GHz (inclusive).

(b) The SAR limits for occupational/controlled exposure are 0.4 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 8 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit for

occupational/controlled exposure is 20 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 6 minutes to determine compliance with occupational/controlled SAR limits.

(c) The SAR limits for general population/uncontrolled exposure are 0.08 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 1.6 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit is 4 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 30 minutes to determine compliance with general population/uncontrolled SAR limits.

(d)(1) Evaluation with respect to the SAR limits in this section must demonstrate compliance with both the whole-body and peak spatial-average limits using technically supported measurement or computational methods and exposure conditions in advance of authorization (licensing or equipment certification) and in a manner that facilitates independent assessment and, if appropriate, enforcement. Numerical computation of SAR must be supported by adequate documentation showing that the numerical method as implemented in the computational software has been fully validated; in addition, the equipment under test and exposure conditions must be modeled according to protocols established by FCC-accepted numerical computation standards or available FCC procedures for the specific computational method.

(2) For operations within the frequency range of 300 kHz and 6 GHz (inclusive), the limits for maximum permissible exposure (MPE), derived from whole-body SAR limits and listed in Table 1 in paragraph (e)(1) of this section, may be used instead of whole-body SAR limits as set forth in paragraphs (a) through (c) of this section to evaluate the environmental impact of human exposure to RF radiation as specified in § 1.1307(b) of this part, except for portable devices as defined in § 2.1093 of this chapter as these evaluations shall be performed according to the SAR provisions in § 2.1093.

(3) At operating frequencies above 6 GHz, the MPE limits listed in Table 1 in paragraph (e)(1) of this section shall be used in all cases to evaluate the environmental impact of human exposure to RF radiation as specified in § 1.1307(b) of this part.

(4) Both the MPE limits listed in Table 1 in paragraph (e)(1) of this section and the SAR limits as set forth in paragraphs (a) through (c) of this section are for continuous exposure, that is, for indefinite time periods. Exposure levels higher than the limits are permitted for shorter exposure times, as long as the average exposure over a period not more than the specified averaging time in Table 1 in paragraph (e)(1) is less than (or equal to) the exposure limits. Detailed information on our policies regarding procedures for evaluating compliance with all of these exposure limits can be found in the most recent edition of FCC's OET Bulletin 65, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields," and its supplements, all available at the FCC's internet website: <https://www.fcc.gov/general/oet-bulletins-line>, and in the Office of Engineering and Technology (OET) Laboratory Division Knowledge Database (KDB) (<https://www.fcc.gov/kdb>).

Note to paragraphs (a) through (d): SAR is a measure of the rate of energy absorption due to exposure to RF electromagnetic energy. These SAR limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized SAR in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," ANSI/IEEE Std C95.1–1992, copyright 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," NCRP Report No. 86, Section 17.4.5, copyright 1986 by NCRP, Bethesda, Maryland 20814. Limits for whole body SAR and peak spatial-average SAR are based on recommendations made in both of these documents. The MPE limits in Table 1 are based generally on criteria published by the NCRP in "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," NCRP Report No. 86, Sections 17.4.1, 17.4.1.1, 17.4.2 and 17.4.3, copyright 1986 by NCRP, Bethesda, Maryland 20814. In the frequency range from 100 MHz to 1500 MHz, these MPE exposure limits for field strength and power density are also generally based on criteria recommended by the ANSI in Section 4.1 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," ANSI/IEEE Std C95.1–1992, copyright 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017.

(e)(1) Table 1 to § 1.1310(e)(1) sets forth limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields.

Table 1 to § 1.1310(e)(1)—Limits for Maximum Permissible Exposure (MPE)				
Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63*(100)		≤6
3.0-30	1842/f	4.89/f <sup>2</sup> )	*(900/f <sup>2</sup> )	<6
30-300		61.4	0.163	1.0
300-1,500	.		f/300	<6
1,500-100,000	.			5
(ii) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63*(100)		<30
1.34-30	824/f	2.19/f <sup>2</sup> )	*(180/f <sup>2</sup> )	<30
30-300		27.5	0.073	0.2
300-1,500	.		f/1500	<30
1,500-100,000	.			<30

f = frequency in MHz. \* = Plane-wave equivalent power density.

(2) Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. The phrase fully aware in the context of applying these exposure limits means that an exposed person has received written and/or verbal information fully explaining the potential for RF exposure resulting from his or her employment. With the exception of transient persons, this phrase also means that an exposed person has received appropriate training regarding work practices relating to controlling or mitigating his or her exposure. In situations when an untrained person is transient through a location where occupational/controlled limits apply, he or she must be made aware of the potential for exposure and be supervised by trained personnel pursuant to § 1.1307(b)(2) of this part where use of time averaging is required to ensure compliance with the general population exposure limit. The phrase exercise control means that an exposed person is allowed and also knows how to reduce or avoid exposure by administrative or

engineering work practices, such as use of personal protective equipment or time averaging of exposure.

(3) General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure. For example, RF sources intended for consumer use shall be subject to the limits for general population/uncontrolled exposure in this section.

**47 C.F.R. § 2.803**

**§ 2.803 Marketing of radio frequency devices prior to equipment authorization**

(a) Marketing, as used in this section, includes sale or lease, or offering for sale or lease, including advertising for sale or lease, or importation, shipment, or distribution for the purpose of selling or leasing or offering for sale or lease.

(b) General rule. No person may market a radio frequency device unless:

(1) For devices subject to authorization under certification, the device has been authorized in accordance with the rules in subpart J of this chapter and is properly identified and labeled as required by § 2.925 and other relevant sections in this chapter; or

(2) For devices subject to authorization under Supplier's Declaration of Conformity in accordance with the rules in subpart J of this part, the device complies with all applicable technical, labeling, identification and administrative requirements; or

(3) For devices that do not require a grant of equipment authorization under subpart J of this chapter but must comply with the specified technical standards prior to use, the device complies with all applicable, technical, labeling, identification and administrative requirements.

(c) Exceptions. The following marketing activities are permitted prior to equipment authorization:

(1) Activities conducted under market trials pursuant to subpart H of part 5 of this chapter or in accordance with a Spectrum Horizons experimental radio license issued pursuant to subpart I of part 5.

(2) Limited marketing is permitted, as described in the following text, for devices that could be authorized under the current rules; could be authorized under waivers of such rules that are in effect at the time of marketing; or could be authorized under rules that have been adopted by the Commission but that have not yet become effective. These devices may not be operated unless permitted by § 2.805.

(i) Conditional sales contracts (including agreements to produce new devices manufactured in accordance with designated specifications) are permitted between manufacturers and wholesalers or retailers provided that delivery is made contingent upon compliance with the applicable equipment authorization and technical requirements.

(ii) A radio frequency device that is in the conceptual, developmental, design or pre-production stage may be offered for sale solely to business, commercial, industrial, scientific or medical users (but not an offer for sale to other parties or to end users located in a residential environment) if the prospective buyer is advised in writing at the time of the offer for sale that the equipment is subject to the FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution.

(iii)(A) A radio frequency device may be advertised or displayed, (e.g., at a trade show or exhibition) if accompanied by a conspicuous notice containing this language:

This device has not been authorized as required by the rules of the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained.

(B) If the device being displayed is a prototype of a device that has been properly authorized and the prototype, itself, is not authorized due to differences between the prototype and the authorized device, this language may be used instead:  
Prototype. Not for Sale.

(iv) An evaluation kit as defined in § 2.1 may be sold provided that:

(A) Sales are limited to product developers, software developers, and system integrators;

(B) The following notice is included with the kit:

FCC NOTICE: This kit is designed to allow:

(1) Product developers to evaluate electronic components, circuitry, or software associated with the kit to determine whether to incorporate such items in a finished product and

(2) Software developers to write software applications for use with the end product. This kit is not a finished product and when assembled may not be resold or otherwise marketed unless all required FCC equipment authorizations are first obtained. Operation is subject to the condition that this product not cause harmful interference to licensed radio stations and that this product accept harmful interference. Unless the assembled kit is designed to operate under part 15, part 18 or part 95 of this chapter, the operator of the kit must operate under the authority of an FCC license holder or must secure an experimental authorization under part 5 of this chapter.

(C) The kit is labeled with the following legend: For evaluation only; not FCC approved for resale; and

(D) Any radiofrequency transmitter employed as part of an evaluation kit shall be designed to comply with all applicable FCC technical rules, including frequency use, spurious and out-of-band emission limits, and maximum power or field strength ratings applicable to final products that would employ the components or circuitry to be evaluated.

(d) Importation. The provisions of subpart K of this part continue to apply to imported radio frequency devices.

**47 C.F.R. § 2.1091**

**§ 2.1091 Radiofrequency radiation exposure evaluation: mobile devices.**

<Text effective until OMB approval given for amendment by 85 FR 18146, as delayed by 85 FR 33578.>

(a) Requirements of this section are a consequence of Commission responsibilities under the National Environmental Policy Act to evaluate the environmental significance of its actions. See subpart I of part 1 of this chapter, in particular § 1.1307(b).

(b) For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

(c)(1) Mobile devices that operate in the Commercial Mobile Radio Services pursuant to part 20 of this chapter; the Cellular Radiotelephone Service pursuant to part 22 of this chapter; the Personal Communications Services pursuant to part 24 of this chapter; the Satellite Communications Services pursuant to part 25 of this chapter; the Miscellaneous Wireless Communications Services pursuant to part 27 of this chapter; the Upper Microwave Flexible Use Service pursuant to part 30 of this chapter; the Maritime Services (ship earth station devices only) pursuant to part 80 of this chapter; the Specialized Mobile Radio Service, and the 3650 MHz Wireless Broadband Service pursuant to part 90 of this chapter; the 76–81 GHz Band Radar Service pursuant to part 95 of this chapter; and the Citizens Broadband Radio Service pursuant to part 96 of this chapter are subject to routine environmental evaluation for RF exposure prior to equipment authorization or use if:

- (i) They operate at frequencies of 1.5 GHz or below and their effective radiated power (ERP) is 1.5 watts or more, or
- (ii) They operate at frequencies above 1.5 GHz and their ERP is 3 watts or more.

(2) Unlicensed personal communications service devices, unlicensed millimeter-wave devices, and unlicensed NII devices authorized under §§

15.255(g), 15.257(g), 15.258, 15.319(i), and 15.407(f) of this chapter are also subject to routine environmental evaluation for RF exposure prior to equipment authorization or use if their ERP is 3 watts or more or if they meet the definition of a portable device as specified in § 2.1093(b) requiring evaluation under the provisions of that section.

(3) All other mobile and unlicensed transmitting devices are categorically excluded from routine environmental evaluation for RF exposure prior to equipment authorization or use, except as specified in §§ 1.1307(c) and 1.1307(d) of this chapter.

(4) Applications for equipment authorization of mobile and unlicensed transmitting devices subject to routine environmental evaluation must contain a statement confirming compliance with the limits specified in paragraph (d) of this section. Technical information showing the basis for this statement must be submitted to the Commission upon request.

(d) The limits to be used for evaluation are specified in § 1.1310 of this chapter. All unlicensed personal communications service (PCS) devices and unlicensed NII devices shall be subject to the limits for general population/uncontrolled exposure.

(1) For purposes of analyzing mobile transmitting devices under the occupational/controlled criteria specified in § 1.1310 of this chapter, time-averaging provisions of the guidelines may be used in conjunction with typical maximum duty factors to determine maximum likely exposure levels.

(2) Time-averaging provisions may not be used in determining typical exposure levels for devices intended for use by consumers in general population/uncontrolled environments as defined in § 1.1310 of this chapter. However, “source-based” time-averaging based on an inherent property or duty-cycle of a device is allowed. An example of this is the determination of exposure from a device that uses digital technology such as a time-division multiple-access (TDMA) scheme for transmission of a signal. In general, maximum average power levels must be used to determine compliance.

(3) If appropriate, awareness of exposure from devices in this section can be accomplished by the use of visual advisories (such as labeling, embossing, or on an equivalent electronic display) and by providing users with information concerning minimum separation distances from radiating structures and proper installation of antennas.

- (i) Visual advisories shall be legible and clearly visible to the user from the exterior of the device.
  - (ii) Visual advisories used on devices that are subject to occupational/controlled exposure limits must indicate that the device is for occupational use only, must refer the user to specific information on RF exposure, such as that provided in a user manual, and must note that the advisory and its information is required for FCC RF exposure compliance. Such instructional material must provide the user with information on how to use the device in order to ensure compliance with the occupational/controlled exposure limits.
  - (iii) A sample of the visual advisory, illustrating its location on the device, and any instructional material intended to accompany the device when marketed, shall be filed with the Commission along with the application for equipment authorization.
  - (iv) For occupational devices, details of any special training requirements pertinent to limiting RF exposure should also be submitted. Holders of grants for mobile devices to be used in occupational settings are encouraged, but not required, to coordinate with end-user organizations to ensure appropriate RF safety training.
- (4) In some cases, e.g., modular or desktop transmitters, the potential conditions of use of a device may not allow easy classification of that device as either mobile or portable (also see § 2.1093). In such cases, applicants are responsible for determining minimum distances for compliance for the intended use and installation of the device based on evaluation of either specific absorption rate (SAR), field strength or power density, whichever is most appropriate.

**47 C.F.R. § 2.1093**

**§ 2.1093 Radiofrequency radiation exposure evaluation: portable devices.**

<Text of section effective until the effective date of the amendment by 85 FR 18147, delayed indefinitely by 85 FR 33578.>

- (a) Requirements of this section are a consequence of Commission responsibilities under the National Environmental Policy Act to evaluate the environmental

significance of its actions. See subpart I of Part 1 of this chapter, in particular § 1.1307(b).

(b) For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.

(c)(1) Portable devices that operate in the Cellular Radiotelephone Service pursuant to part 22 of this chapter; the Personal Communications Service (PCS) pursuant to part 24 of this chapter; the Satellite Communications Services pursuant to part 25 of this chapter; the Miscellaneous Wireless Communications Services pursuant to part 27 of this chapter; the Upper Microwave Flexible Use Service pursuant to part 30 of this chapter; the Maritime Services (ship earth station devices only) pursuant to part 80 of this chapter; the Specialized Mobile Radio Service, the 4.9 GHz Band Service, and the 3650 MHz Wireless Broadband Service pursuant to part 90 of this chapter; the Wireless Medical Telemetry Service (WMTS), the Medical Device Radiocommunication Service (MedRadio), and the 76–81 GHz Band Radar Service pursuant to subparts H, I, and M of part 95 of this chapter, respectively; unlicensed personal communication service, unlicensed NII devices and millimeter-wave devices authorized under §§ 15.255(g), 15.257(g), 15.258, 15.319(i), and 15.407(f) of this chapter; and the Citizens Broadband Radio Service pursuant to part 96 of this chapter; are subject to routine environmental evaluation for RF exposure prior to equipment authorization or use.

(2) All other portable transmitting devices are categorically excluded from routine environmental evaluation for RF exposure prior to equipment authorization or use, except as specified in §§ 1.1307(c) and 1.1307(d) of this chapter.

(3) Applications for equipment authorization of portable transmitting devices subject to routine environmental evaluation must contain a statement confirming compliance with the limits specified in paragraph (d) of this section. Technical information showing the basis for this statement must be submitted to the Commission upon request.

(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (“SAR”) in Section 4.2 of “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz,”

ANSI/IEEE C95.1–1992, Copyright 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in “Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields,” NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter. Measurements and calculations to demonstrate compliance with MPE field strength or power density limits for devices operating above 6 GHz should be made at a minimum distance of 5 cm from the radiating source.

(1) The SAR limits for occupational/controlled exposure are 0.4 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 8 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit for occupational/controlled exposure is 20 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 6 minutes to determine compliance with occupational/controlled SAR limits.

(i) Occupational/Controlled limits apply when persons are exposed as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of visual advisories (such as labeling, embossing, or on an equivalent electronic display) or by specific training or education through appropriate means, such as an RF safety program in a work environment.

(ii) Visual advisories on portable devices designed only for occupational use can be used as part of an applicant's evidence of the device user's awareness of occupational/controlled exposure limits.

(A) Such visual advisories shall be legible and clearly visible to the user from the exterior of the device.

(B) Visual advisories must indicate that the device is for occupational use only, refer the user to specific information on RF exposure, such as that provided in a user manual and note that the advisory and its information is required for FCC RF exposure compliance.

(C) Such instructional material must provide the user with information on how to use the device in order to ensure compliance with the occupational/controlled exposure limits.

(D) A sample of the visual advisory, illustrating its location on the device, and any instructional material intended to accompany the device when marketed, shall be filed with the Commission along with the application for equipment authorization. Details of any special training requirements pertinent to limiting RF exposure should also be submitted.

(E) Holders of grants for portable devices to be used in occupational settings are encouraged, but not required, to coordinate with end-user organizations to ensure appropriate RF safety training.

(2) The SAR limits for general population/uncontrolled exposure are 0.08 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 1.6 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit is 4 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 30 minutes to determine compliance with general population/uncontrolled SAR limits.

(i) General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure.

(ii) Visual advisories (such as labeling, embossing, or on an equivalent electronic display) on consumer devices such as cellular

telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section.

(3) Compliance with SAR limits can be demonstrated by either laboratory measurement techniques or by computational modeling. The latter must be supported by adequate documentation showing that the test device and exposure conditions have been correctly modeled in accordance with the operating configurations for normal use. Guidance regarding SAR measurement techniques can be found in the Office of Engineering and Technology (OET) Laboratory Division Knowledge Database (KDB). The staff guidance provided in the KDB does not necessarily represent the only acceptable methods for measuring RF exposure or emissions, and is not binding on the Commission or any interested party.

(4) For purposes of analyzing portable transmitting devices under the occupational/controlled criteria, the time-averaging provisions of the MPE guidelines identified in § 1.1310 of this chapter can be used in conjunction with typical maximum duty factors to determine maximum likely exposure levels.

(5) Time-averaging provisions of the MPE guidelines identified in § 1.1310 of this chapter may not be used in determining typical exposure levels for portable devices intended for use by consumers, such as hand-held cellular telephones, that are considered to operate in general population/uncontrolled environments as defined above. However, “source-based” time-averaging based on an inherent property or duty-cycle of a device is allowed. An example of this would be the determination of exposure from a device that uses digital technology such as a time-division multiple-access (TDMA) scheme for transmission of a signal. In general, maximum average power levels must be used to determine compliance.

**CERTIFICATE OF FILING AND SERVICE**

I, William J. Scher, hereby certify that on November 9, 2020, I filed the foregoing Statutory Addendum with the Clerk of the Court for the United States Court of Appeals for the District of Columbia Circuit using the electronic CM/ECF system. Participants in the case who are registered CM/ECF users will be served by the CM/ECF system.

s/ William J. Scher

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